

**WHAT IS CLAIMED IS:**

1. An optical processing apparatus comprising:  
means for irradiating a light to a semiconductor film; and  
means for controlling an irradiation energy of the light based on a refractive index of the semiconductor film to which the light had been irradiated.
2. An optical processing apparatus comprising:  
means for irradiating a light to a semiconductor film;  
means for controlling an irradiation energy of the light based on a refractive index of the semiconductor film to which the light had been irradiated; and  
means for causing the light to be repeatedly irradiated to the semiconductor film until the refractive index of the semiconductor film becomes a predetermined value.
3. A method for manufacturing a semiconductor device comprising the steps of:  
forming a semiconductor film over a substrate;  
irradiating a laser light onto the semiconductor film to crystallize the semiconductor film, and  
controlling an irradiation energy of the laser light based on a refractive index of the semiconductor film on which the laser light has been irradiated so that the refractive index of the semiconductor film is within a predetermined range,  
wherein the refractive index is measured by an ellipsometer.
4. The method according to claim 3, wherein the laser light is selected from the group consisting of KrF excimer laser light, ArF excimer laser light and XeCl excimer laser light.
5. The method according to claim 3, wherein the irradiating step is performed by relatively scanning the laser light with respect to the substrate.

6. A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film formed over a substrate;

irradiating a laser light onto the semiconductor film to crystallize the semiconductor film; and

controlling an irradiation energy of the laser light based on a refractive index of the semiconductor film on which the laser light has been irradiated,

wherein the laser light is repeatedly irradiated onto the semiconductor film until the refractive index of the semiconductor film becomes within a predetermined range,

wherein the refractive index is measured by an ellipsometer.

7. The method according to claim 6, wherein the laser light is selected from the group consisting of KrF excimer laser light, ArF excimer laser light and XeCl excimer laser light.

8. The method according to claim 6, wherein the irradiating step is performed by relatively scanning the laser light with respect to the substrate.

9. A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film formed over a substrate;

irradiating a first laser light onto the semiconductor film to crystallize the semiconductor film; and

irradiating a second laser light onto the semiconductor film to further crystallize the semiconductor film,

wherein an irradiation energy of the second laser light is controlled so that a refractive index is within a predetermined range,

wherein the refractive index is measured by an ellipsometer.

10. The method according to claim 9, wherein each of the first and second laser lights is selected from the group consisting of KrF excimer laser light, ArF excimer laser light and XeCl excimer laser light.

11. The method according to claim 9, wherein the irradiating step using each of the first and second laser lights is performed by relatively scanning the laser light with respect to the substrate.

12. A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film formed over a substrate;

irradiating a first laser light onto the semiconductor film to crystallize the semiconductor film;

measuring a first refractive index of the semiconductor film on which the first laser light has been irradiated;

irradiating a second laser light onto the semiconductor film to further crystallize the semiconductor film; and

measuring a second refractive index of the semiconductor film on which the second laser light has been irradiated,

wherein an irradiation energy of the second laser light is controlled based on the first refractive index.

13. The method according to claim 12, wherein each of the first and second laser lights is selected from the group consisting of KrF excimer laser light, ArF excimer laser light and XeCl excimer laser light.

14. The method according to claim 12, wherein the irradiating step using each of the first and second laser lights is performed by relatively scanning the laser lights with respect to the substrate.

15. The method according to claim 12, wherein the first and second refractive index are measured by an ellipsometer.

16. A method for manufacturing a semiconductor device comprising the steps of:

forming a first semiconductor film over a first substrate;

irradiating a first laser light onto the first semiconductor film to

crystallize the first semiconductor film;

measuring a refractive index of the first semiconductor film;

forming a second semiconductor film formed over a second substrate;

and

irradiating a second laser light onto the second semiconductor film to crystallize the second semiconductor film,

wherein an irradiation energy of the second laser light is controlled based on the refractive index of the first semiconductor film so that the refractive index of the second semiconductor film is within a predetermined range.

17. The method according to claim 16, wherein each of the first and second laser lights is selected from the group consisting of KrF excimer laser light, ArF excimer laser light and XeCl excimer laser light.

18. The method according to claim 16, wherein the irradiating step using the first light is performed by relatively scanning the first laser light with respect to the first substrate.

19. The method according to claim 16, wherein the irradiating step using the second light is performed by relatively scanning the second laser light with respect to the second substrate.

20. The method according to claim 16, wherein the refractive index is measured by an ellipsometer.